

# **National Tree Fruit Technology Roadmap**

Talking points USDA listening session, Cheney WA 11/3/05

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## NATIONAL TREE FRUIT TECHNOLOGY ROADMAP

### SPECIALTY CROPS HAVE EMERGED

Economic impact now exceeds program crops... we are not "minor crops"

We require R&D to continue to compete globally

WE HAVE A PLAN -- THE *NATIONAL TECHNOLOGY ROADMAP* -- NOW A MODEL AT USDA

WE ARE BUILDING COALITIONS WITH SHARED PRIORITIES AND SHARED INVESTMENT      Apple, pear, cherry, peach (WA, OR, CA, MI, NY, PA, VA)

Grape & wine, citrus, caneberry

WE HAVE VALUE AND A FUTURE, BUT REQUIRE CONTINUED, PARTNERED R&D INVESTMENT For more applied and new technologies

WE REQUEST A BALANCED INVESTMENT IN SPECIALTY CROPS IN THE FARM BILL AND ONGOING R&D AT USDA

WE EXPECT AN ROI LIKE THESE SUCCESSES IN 2005:

National Rosaceous genomics research initiative = \$4M

Ctr for Precision Ag = \$3M

Grape and tree fruit risk management = \$750K

WSU bioinformatics and genomics = \$500K

### SPECIALTY CROPS OFFER

Healthy, affordable, safe food

Growing domestic and export markets

Living wage, year-round jobs

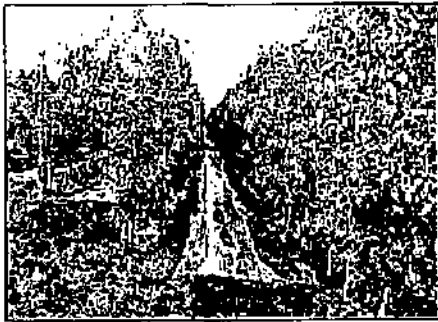
Economically viable rural economies

Return on research investment

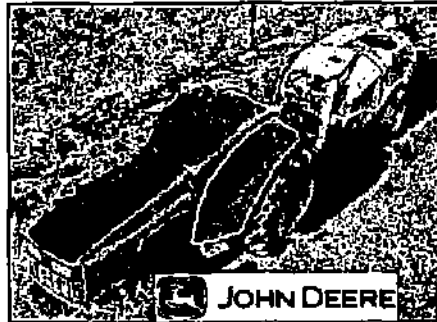
**Only new technologies can simultaneously give us increased quality, productivity, and allow new marketing strategies. All of which we need to complete successfully in global markets**

# National Tree Fruit Technology Roadmap

...putting the pieces together...



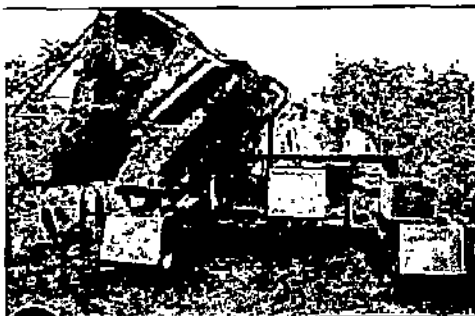
Orchard design



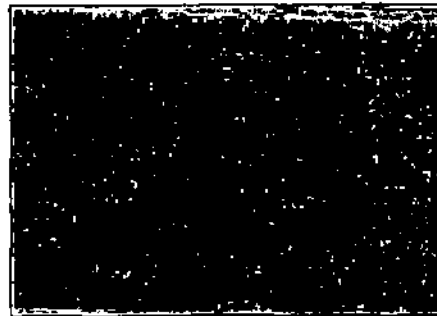
Robotic tractors



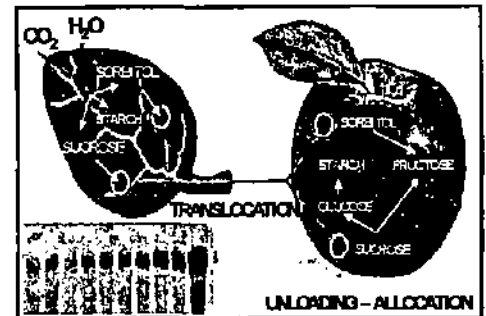
Water management



Orchard assist



Remote sensing



Genetics/Genomics

## TECHNOLOGY ROADMAP TARGETS

Lower unit costs of production & processing

Continually redefine product quality

*To be profitable in a globally competitive marketplace, the US tree fruit industry must deliver the highest quality fruit*

# Technology Roadmap History

**2000**

Washington group develops initial vision and first Technology Roadmap

**2001**

National effort undertaken with representative steering group

**2002**

USApple and Northwest Horticultural Council propose FY2003 Congressional language  
US Congress requests strategic document via USDA-ARS

**2003**

D.C. workshop creates vision statement to guide a National Technology Roadmap initiative

***To be profitable in a globally competitive market, the U.S. tree fruit industry must deliver***

***the highest quality fruit and reduce production costs 30% by 2010***

US Congress requests national strategy: regional industry organizations establish priorities

Genomics, genetics, breeding

Automation, sensors, diagnostics, precision agriculture

**2004**

National Rosaceous genomics, genetics and breeding workshop

USDA-ARS creates new position in Wenatchee, WA to study molecular genetics of fruit quality

Washington tree fruit and wine grape industries receive \$750k FICA Grower Tools grant

**2005**

USDA-CSREES National Research Initiative: Genomics, Genetics and Breeding program \$4M

USDA-ARS commits to initiative planning for automation, sensors, & precision ag

National Rosaceous Genomics, Genetics and Breeding Executive Committee (RoseExecCom)

Center for Precision Agricultural Systems initiative \$2.8M

WSU creates two new faculty positions: 1) bioinformatics, 2) Rosaceous crops genomics

Competitive Perennial Cropping Systems 2015 Initiative (WA, OR, CA, PA, MI )

# Justification

Bernanke 1/3

This is a transcript of an interview with the new Chairman of the Fed board, Ben Bernanke. He is interviewed by John Makin who is a private Economist, former Fed governor and resident scholar at AEI. The seminar was: C. Peter McColough Series on International Economics: Productivity Growth and Monetary Policy Jan 19 2005

Productivity, as measured by hours/bin, for tree fruits has fallen since the 80's as we do more select and color picking. These guys say productivity is more important than we in the industry have realized. Read the bold print at least.

**BEN BERNANKE:** Thanks, John. I'm going to talk today about productivity, which is probably the most, you know, it's not the variable you see every day in *The Wall Street Journal*, but it's probably the most important, or one of the most important variables of the macro economy.

We've had quite substantial developments in productivity in recent years. Between the '70s and 1995, labor productivity growth-and when I talk about productivity I'll be referring to output per hour-grew between one [percent] and 1.5 percent a year, a relatively disappointing rate of growth, and less than we saw in other major industrial countries. Between 1995 and 2001, however, productivity growth rose to about 2.5 percent a year-a pretty significant change in the context of these things, and a contributor to the view at the time that we're, perhaps, entering a new economy. Of course, the stock market was part of that story as well. Talk of the new economy faded with the stock market and the high-tech evaluations in particular around 2000. But interestingly enough, and perhaps not evident to everyone-certainly to most people here, but not to the general public-productivity growth actually accelerated after 2001. Over the last four years, the pace of productivity gains have been better than 4 percent per year, despite all the adverse developments-9/11, the recession, and all the other factors.

Now, why is productivity so important? You know, I've written a couple of economics textbooks, and we all know that in the long run, productivity growth is essentially the only determinant of living standards. In the shorter run, the link between productivity and living standards is a bit more loose, as we've seen in the last few years. We've had high productivity, but we've also had things like changes in labor participation, we've had changes in the split between capital labor and income, so the link is a little bit looser in the short run. Nevertheless, productivity growth is still very important because it has very

**significant macroeconomic impact, even in the short run, including effects on growth, inflation, and employment.**

What I'd like to do today in the time I have, is first talk a bit about why productivity seems to have changed into a new dynamic, has entered a new era in some sense in the last decade. It's important to try to understand that because we are also interested in knowing where productivity is going to go in the next few years, and I'll talk a bit about that. And then finally at the end, I'll come back and I'll say something about how our productivity projections and expectations influence the economic outlook and monetary policy.

So, let me start and talk first a bit about the last 10 years and why productivity growth seems to have picked up. The economic consensus on this issue has evolved somewhat over time. By around 2000, there was a pretty widespread view among economists that the main driver of the pickup in the productivity growth was advances in information and communication technologies, ICT, during the 1990s. The general analysis showed that ICT improvements had expanded the productivity of the U.S. economy in at least two important and distinct ways. First, technological advances allowed the ICT-producing industries—the industries that produced the computers, the communications equipment, and so on—to expand their rate of productivity growth. For example, there were advances in chip manufacturing processes, and increases in the speed of the product cycle, of Intel, for example, that literally increased the quantity and value of chip production in the U.S., and thereby raised labor productivity in that sector. But, of course, just increasing the productivity of the ICT-producing sector is not really what this game is all about. What's interesting is the extent to which improvements in ICT led to productivity increases in the ICT-using sectors, that is, most of the economy. And here, the evidence suggests that in the United States that a wide range of industries, including service, durable goods, and other industries, were able to use these new technologies to reduce their costs and increase their quality. The McKinsey study in 2001 was particularly informative about some of the details.

I think many people here are at least broadly familiar with some of the sea changes in industry that have taken place in the last 10 years in a wide variety of areas. Take retailing, for example—not what we used to think of as a high-tech industry, but Wal-Mart has used IT tools to improve the management of their supply chains, increased their ability to respond to changes in consumer demand. Wal-Mart typically knows, I think, on Monday afternoon exactly what the composition of purchases was on Monday morning all across the country, and they can respond with lightning speed to changes in consumer demand. In other sectors, here in New York, many of you work for brokers and traders and dealers, and you know something about how automation of trading processes and back-office operations has increased productivity in the financial services industry. In durable goods, General Motors and other automobile companies have, for example, developed programmable tooling systems to increase the flexibility of their production processes. So, for example, now a GM plant can produce vehicles from different platforms all in the same line because of the ability to shift from one setup to another.

## Bernanke 3/3

More broadly, there's a nice study by Kevin Stiroh, who's at the New York Fed, who's been one of the leaders in recent productivity research, who found that nearly two-thirds of the U.S. industry, comprising about 70 percent of U.S. employment, experienced an acceleration of productivity in the later 1990s. And he found that the growth of productivity across industry was positively correlated with the intensity of ICT use in that industry, given *prima facie* evidence in favor of the ICT causality. So, there's no doubt, I think, that at this point that the ICT revolution and the productivity revolution [in] the U.S. are connected. But there are some puzzles that have arisen that have made economists in the last four or five years think harder, I think, about exactly how those two phenomena are related.

First, it's interesting to note that the United States, of course, was not the only country to see a rapid expansion in ICT investment. Similar patterns are seen in a number of other industrial countries. And yet with a few exceptions, and there have been some exceptions, productivity growth in other advanced industrial countries has not increased to the same degree that it's happened in the United States. In comparison with members of the European Union, it's particularly interesting in this regard. Throughout most of the post-World War II period, labor productivity growth in Europe grew more quickly, exceeded the rate of growth in the United States. First, there was the post-war reconstruction as Europe rebuilt and, of course, returned to normalcy. And then over time, there was a continued convergence as European business practices, technology, and the like, approached the American standard. Indeed, [Northwestern University's] Bob Gordon, another leader in productivity research, has estimated that European productivity in 1950 was only 44 percent that of the U.S. level, whereas in 1995 it had risen to 94 percent. That is, a convergence was approaching. However, since 1995, because productivity has picked up more in the U.S. than in Europe, there's actually been some divergence. That is, the difference between the U.S. and European productivity levels has begun to expand.



O'Rourke 1/2

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Economist warns farmers of competition

By LIA STEAKLEY

~~YAKIMA HERALD-REPUBLIC~~

Washington farmers' technological advantages are slipping. Competition from rapidly growing countries with cheaper work forces such as India and China are intensifying. And consumers' tastes and lifestyles at home and abroad are quickly evolving.

The convergence could spell doom for local growers, shippers and exporters unless companies change their marketing models and operations, a longtime regional economist said Tuesday during Central Washington University's seventh annual Economic Outlook Conference.

"The last few years have been a very difficult time for agriculture," Desmond O'Rourke, president of the economic consulting firm Belrose Inc., told an audience of roughly 80 people. "We are still nowhere near being out of the woods," warned O'Rourke, a retired Washington State University economics professor.

Growers and exporters must take risks by making radical changes to stave off competitors and maintain ~~all~~ or increase ~~all~~ market share, he said.

Paying attention to global demographic changes in the next 20 years, using innovative marketing tactics and advances in technology in agriculture will help keep Central Washington growers and exporters on top.

Overseas markets in developing countries will be increasingly important for growers and exporters. In the next two decades, 98.6 percent of the increase in world population will be in developing countries, O'Rourke said.

"When incomes of poorer people rise, much of the (additional money) is spent on food," he said. "But foods must be adapted for local customs, religions or lifestyles."

However, he said, if trade regulations aren't relaxed to enable Washington exporters access to these markets, the state's agriculture industry will suffer. O'Rourke hopes good news will flow from the World Trade Organization talks set for December in Hong Kong.

"As long as WTO can't come to agreement, we are essentially blocked in getting products to many of these markets," he said.

In addition to gaining access to countries with fast-growing populations with rising incomes, Washington farmers need new technology to give them advantages over competitors such as China and India.

~~"Our big advantage used to be that we had superior agriculture technology, so we got higher yields and the land was more productive,"~~ said O'Rourke.

~~Research and development of new farm technologies is expensive and comes in small steps. New technology could help farmers and exporters recover lost market share or propel an industry out of reach of competitors.~~

O'Rourke 2/2

O'Rourke pointed to the success story of controlled atmosphere storage which became available to the apple industry in the 1960s and helped exporters sell fruit year-round as an example of technology giving farmers an advantage over competitors.

Growers, packers and exporters should also fine-tune their marketing strategies to be more effective, O'Rourke said. The consumer market is fragmented. Specialty grocers such as Austin, Texas-based Whole Foods and discount retailers including Wal-Mart are leaving few customers for traditional grocery stores. Within the high-end and discount consumer groups, shoppers' tastes are further divided.

Household purchases no longer fall to just one person. Busy lifestyles, cultural differences and concerns about nutrition have transformed what used to be a handful of main markets into myriad markets.

"Our best hope is to cater to the changing demands of the marketplace," said O'Rourke. He suggested identifying the mix of attributes that are attractive to different consumer segments and then finding nontraditional ways of promoting to those segments while efficiently deliver products to consumers.

Despite the tough competition the local agriculture industry faces, O'Rourke is optimistic.

"Pacific Northwest operators have begun to understand the momentous changes taking place. Many have already begun to remake themselves," he said. "In 10 years we could look back on an amazing transformation."

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